

**ABSTRACT**

A system and method for assigning IP addresses in an Ethernet passive optical network which includes one OLT (Optical Line Terminal) and a plurality of ONTs (Optical Network Terminals) connected to the OLT are disclosed. The method includes the steps of

5 including a dynamic host configuration protocol (DHCP) server in the OLT, establishing IP address pools including at least one IP address according to the ONTs, and searching for an ONT from a MAC processing section of the OLT by means of a MAC address from which IP address assignment is requested when IP address assignment is requested from one of the ONTs. The ONT is connected to a DHCP client. The DHCP server assigns an available IP

10 address existing in an IP address pool established for the ONT having requested the IP address assignment according to ONTs.